

Trend Study 16C-27-04

Study site name: Birch Creek Chaining.

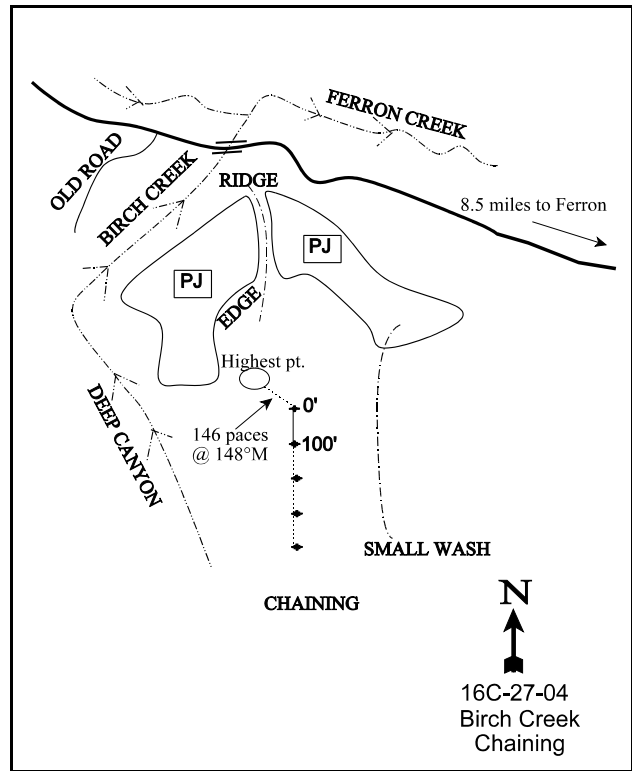
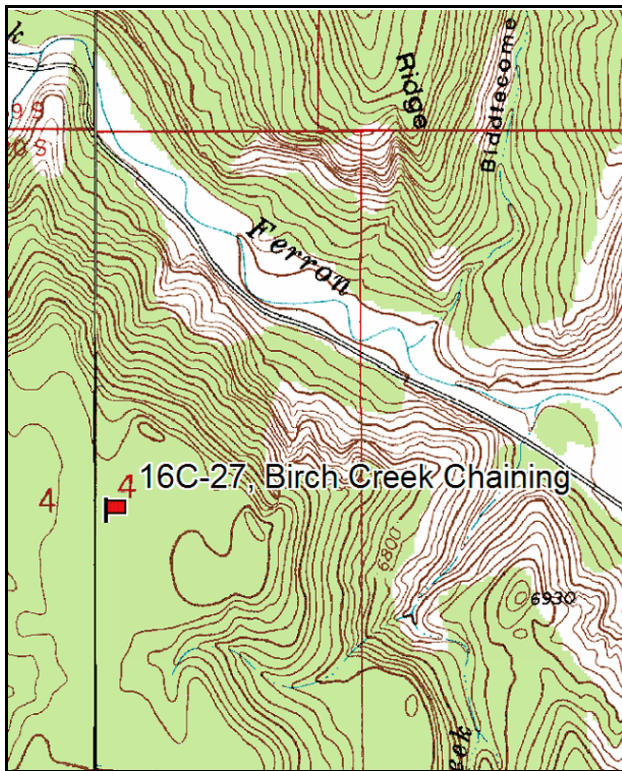
Vegetation type: Chained, Seeded-PJ.

Compass bearing: frequency baseline 180 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Ferron, go west up the Ferron Canyon Road approximately 8.5 miles, past Millsite Reservoir and the FS boundary, to a bridge over Birch Creek, a tributary of Ferron Creek (2.1 miles from forest boundary). The Birch Creek chaining is located on top of the bench to the south. The easiest way to the study site is to hike up along the steep and rocky ridge to the P-J on top. Continue south up through the P-J to the edge of the chaining. The study site is in the middle of the chaining, marked by 18" fenceposts. From the highest point along the edge of the P-J, walk south (148° M) for 146 paces to the 0-foot baseline stake. This stake is marked by browse tag #9026.



Map Name: Flagstaff Peak

Diagrammatic Sketch

Township 20S, Range 6E, Section 4

GPS: NAD 27, UTM 12S 4328632 N, 478417 E

DISCUSSION

Birch Creek Chaining - Trend Study No. 16C-27

The Birch Creek Chaining trend study is located on the remote, north end of a bench on Forest Service land above Ferron Creek. A large area was chained, trenched on contour, and seeded in 1972. Mountain big sagebrush is the dominant vegetation over much of the area with grasses fairly abundant within the chaining. On this side of the mesa, general exposure is to the west and the terrain is gently sloping (5%). The study is located in the center of the chaining at an elevation of 7,950 feet. Elk and deer pellet groups are moderately abundant. Pellet group data from 1999 estimate 11 deer, 35 elk and 23 cow days use/acre (27 ddu/ha, 87 edu/ha, and 57 cdu/ha). Rabbit pellets are very abundant. Cows were on the site during the 1999 reading and had heavily utilized much of the grass. This site is part of the Ferron allotment, which is managed by the Forest Service. Pellet group data from 2004 estimate 17 deer, 67 elk, and 22 cow days use/acre (41 ddu/ha, 165 edu/ha, and 56 cdu/ha).

Soil on the site is moderately deep with an effective rooting depth estimated at 15 inches. It is actually deeper, but due to soil compaction, deeper penetrometer readings were not possible. Soil texture is a sandy clay loam with a slightly alkaline pH (7.4). Phosphorus is marginal and potassium is limited at 9.6 ppm and 51.2 ppm respectively. Values less than 10 ppm for phosphorus and 70 ppm for potassium can limit normal plant growth and development. The surface layer is loose and slightly rocky. Shrubs and grasses provides good soil protection, along with abundant litter, but large bare ground spots still exists. The well-vegetated trenches prevent most erosion on this gentle slope. The steeper slopes are more closely terraced and no erosion is evident.

Mountain big sagebrush provided 61% of the browse cover in 1994, 75% in 1999, and 74% in 2004. The population density was estimated at 3,132 plants/acre in 1988, 3,660 in 1999, and 3,540 in 2004. They show moderately use with good vigor. The number of decadent plants has increased from 13% in 1988 and 1999, to 25% in 2004. Recruitment of young have steadily declined since 1988, but in 2004 there are enough young plants to maintain the population. Seedlings were in high production in 2004. The only other common browse consist of released pinyon and juniper trees from the original chaining. Twenty percent of the pinyon and 30% of the juniper consist of surviving chained trees. Point quarter data from 1999 estimate 53 pinyon and 76 juniper trees/acre with average diameters of 3.6 and 3.4 inches respectively. Point quarter data for 2004 estimate 54 pinyon and 77 juniper trees/acre with an average diameter of 4.3 and 3.8 inches. Mature stands of pinyon-juniper were left on the edges and steeper slopes. Valuable browse species such as curlleaf and true mountain mahogany, serviceberry, ephedra, and bitterbrush are found on the undisturbed slopes.

Grasses are a very important forage resource on this chained site. Seeded species include: crested wheatgrass, intermediate wheatgrass, and smooth brome which are the dominate grasses. Crested wheatgrass accounted for 70% of the grass cover in 1994, 74% in 1999, and 87% in 2004. Only a few forbs were found and they provide little forage and provide less than 2% cover.

1994 TREND ASSESSMENT

Bare ground has decreased since 1988 from 29% to 27%. Litter cover has also decreased to only 44% cover with rock and pavement cover combined remained nearly the same. Vegetation cover is split nearly equally between grasses and browse. Soil trend is stable. The key browse is mountain big sagebrush. It displays a stable population with a good recruitment (proportion of young) and a low percent decadency rate. Browse trend is stable. The herbaceous understory trend is slightly down. Sum of nested frequency of both perennial grasses and forbs declined since 1988. However, forbs are very rare and offer little to the community. The majority of the grasses are seeded species with a few natives. The Desirable Components Index rated this site as fair with a score of 59 due to moderate shrub cover, several young shrubs, and low forb cover, although

grass cover was good.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down slightly (2)

winter range condition (DC Index) - 59 (fair) Mountain big sagebrush type - chaining

1999 TREND ASSESSMENT

Trend for soil continues to be stable due to only a minor increase in litter cover and a slight decline in percent cover of bare ground. There is no significant erosion occurring due to the abundant protective ground cover combined with the gentle terrain and the contour furrow treatment. Trend for the key browse species, mountain big sagebrush, is stable. Use is heavier compared to 1994, but vigor is still good, and percent decadence is low at only 13%. Young recruitment has declined steadily since 1988, but there is still appears to be adequate numbers of young plants to maintain the population. Trend for the herbaceous understory is up slightly for grasses. Forbs are very limited and none were encountered in 1999. Nested frequency of crested wheatgrass and smooth brome have both increased significantly. The Desirable Components Index rated this site as fair with a score of 63 due to an increase in shrub cover, increase in young shrubs, and continued high grass cover, but low forb cover.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up slightly (4)

winter range condition (DC Index) - 63 (fair) Mountain big sagebrush type - chaining

2004 TREND ASSESSMENT

Trend for soil is down slightly. Relative percent bare ground increased from 21% in 1999 to 33% in 2004. Relative percent litter cover decreased from 49% in 1999 to 38% in 2004. Protective cover is still sufficient to hold soil from significant erosion. Trend for key browse species, mountain big sagebrush, is stable. Use was moderate and vigor is good (lots of seedheads). Percent decadence increased from 13% in 1999 to 25% in 2004, but strip frequency and quadrat cover both increased. Young recruitment is down compared to the previous years, but still is producing enough to compensate for the decadent plants that are dying. Trend for herbaceous understory is down slightly. Sum nested frequency for grasses has decreased significantly for crested wheatgrass, intermediate wheatgrass, and smooth brome. Forbs increased in nested frequency, but they are so few that they add very little to the total cover. Forb increase was predominately all annual species. The Desirable Components Index rated this site as poor with a score of 49 due to an increase in shrub cover, increase in decadence, and a decrease in grass cover.

TREND ASSESSMENT

soil - down slightly (2)

browse - stable (3)

herbaceous understory - down slightly (2)

winter range condition (DC Index) - 49 (poor) Mountain big sagebrush type - chaining

HERBACEOUS TRENDS --

Management unit 16C, Study no: 27

Type	Species	Nested Frequency				Average Cover %		
		'88	'94	'99	'04	'94	'99	'04
G	Agropyron cristatum	_a 159	_a 154	_b 191	_a 131	8.27	10.18	7.07
G	Agropyron intermedium	_c 162	_b 77	_b 56	_a 15	1.88	.99	.11
G	Bromus inermis	_{bc} 77	_{ab} 53	_c 90	_a 25	1.08	1.47	.28
G	Elymus salina	-	2	-	-	.00	-	.00
G	Oryzopsis hymenoides	37	18	23	15	.61	1.00	.59
G	Sitanion hystrix	_b 23	_a 3	_a 7	_a 5	.00	.04	.03
G	Sporobolus cryptandrus	-	1	-	3	.00	-	.03
G	Stipa pinetorum	_b 9	_a -	_a -	_a -	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0
Total for Perennial Grasses		467	308	367	194	11.88	13.69	8.13
Total for Grasses		467	308	367	194	11.88	13.69	8.13
F	Arabis spp.	-	2	-	-	.03	-	-
F	Chenopodium spp. (a)	-	_a -	_a -	_b 12	-	-	.19
F	Chenopodium fremontii (a)	-	-	-	2	-	-	.03
F	Chenopodium glaucum (a)	_b 9	_a 1	_a -	_a -	.00	-	-
F	Cryptantha spp.	1	-	-	-	-	-	-
F	Descurainia pinnata (a)	-	_a 5	_a -	_b 30	.01	-	.22
F	Ipomopsis aggregata	3	3	-	-	.00	-	-
F	Penstemon caespitosus	5	5	-	-	.03	-	-
F	Senecio multilobatus	_b 11	_a -	_a -	_{ab} 1	-	-	.03
Total for Annual Forbs		9	6	0	44	0.01	0	0.45
Total for Perennial Forbs		20	10	0	1	0.07	0	0.03
Total for Forbs		29	16	0	45	0.09	0	0.48

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --

Management unit 16C, Study no: 27

Type	Species	Strip Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
B	Amelanchier utahensis	0	1	1	-	-	-
B	Artemisia tridentata vaseyana	56	68	71	7.80	11.05	13.35
B	Gutierrezia sarothrae	2	5	4	-	.16	-
B	Juniperus osteosperma	0	1	2	2.36	1.62	1.64
B	Opuntia spp.	1	1	3	-	-	.03
B	Pinus edulis	0	2	2	2.64	1.85	2.99
B	Symphoricarpos oreophilus	0	0	1	-	-	-
Total for Browse		59	78	84	12.81	14.69	18.01

CANOPY COVER, LINE INTERCEPT --

Management unit 16C, Study no: 27

Species	Percent Cover	
	'99	'04
Artemisia tridentata vaseyana	-	17.36
Juniperus osteosperma	2.00	1.70
Opuntia spp.	-	.05
Pinus edulis	-	4.15

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 16C, Study no: 27

Species	Average leader growth (in)
	'04
Artemisia tridentata vaseyana	2.9

POINT-QUARTER TREE DATA --

Management unit 16C, Study no: 27

Species	Trees per Acre	
	'99	'04
Juniperus osteosperma	76	77
Pinus edulis	53	54

Average diameter (in)	
'99	'04
3.4	4.3
3.6	3.8

BASIC COVER --

Management unit 16C, Study no: 27

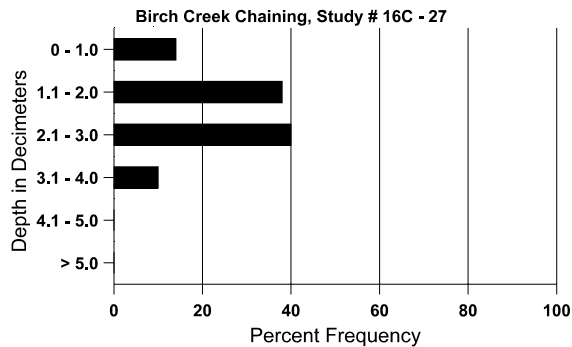
Cover Type	Average Cover %			
	'88	'94	'99	'04
Vegetation	2.50	25.13	27.78	25.98
Rock	1.75	2.50	2.96	2.81
Pavement	2.00	.49	1.72	1.97
Litter	65.00	44.10	56.28	44.98
Cryptogams	0	.09	.04	1.07
Bare Ground	28.75	26.70	24.94	38.90

SOIL ANALYSIS DATA --

Management unit 16C, Study no: 27, Study Name: Birch Creek Chaining

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
15.0	52.0 (12.6)	7.4	72.7	5.4	21.8	1.7	9.6	51.2	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 16C, Study no: 27

Type	Quadrat Frequency		
	'94	'99	'04
Rabbit	31	40	10
Elk	23	18	32
Deer	24	14	9
Cattle	-	3	1

Days use per acre (ha)	
'99	'04
-	-
35 (87)	67 (165)
11 (27)	17 (41)
23 (57)	22 (56)

BROWSE CHARACTERISTICS --

Management unit 16C, Study no: 27

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Amelanchier utahensis												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	20	-	20	-	-	-	0	0	-	-	0	-/-
04	20	-	-	20	-	-	100	0	-	-	0	17/13
Artemisia tridentata vaseyana												
88	3132	600	1066	1666	400	-	43	28	13	-	4	12/18
94	3000	40	700	1960	340	160	31	8	11	1	1	17/27
99	3660	-	540	2660	460	160	26	21	13	2	2	17/27
04	3540	560	340	2320	880	140	38	14	25	10	10	15/32
Gutierrezia sarothrae												
88	66	-	-	66	-	-	0	0	-	-	0	27/11
94	40	-	-	40	-	-	0	0	-	-	0	5/7
99	100	-	-	100	-	-	0	0	-	-	0	6/7
04	140	-	40	100	-	-	0	0	-	-	0	6/11
Juniperus osteosperma												
88	132	-	66	66	-	-	0	0	-	-	0	47/19
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	40	-	-	40	-	20	0	0	-	-	0	-/-
04	40	-	20	20	-	-	0	0	-	-	0	-/-
Opuntia spp.												
88	66	-	-	-	66	-	0	0	100	-	100	-/-
94	20	-	-	20	-	-	0	0	0	-	0	2/4
99	20	-	-	20	-	-	0	0	0	-	0	5/11
04	60	-	-	60	-	-	0	0	0	-	0	4/12
Pinus edulis												
88	332	-	266	66	-	-	0	0	-	-	20	43/57
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	40	-	20	20	-	20	0	0	-	-	0	-/-
04	40	-	20	20	-	-	0	0	-	-	0	-/-
Purshia tridentata												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	31/80
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	0	-	-	-	-	-	0	0	-	-	0	-/-

		Age class distribution (plants per acre)					Utilization					
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Symphoricarpos oreophilus												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	20	-	-	20	-	-	0	0	-	-	0	9/10